

1. *Phragmites australis* (Cav.) Trin. ex Steud.  
 2. *Scirpus americanus* L.  
 3. *Scirpus setaceus* L.  
 4. *Scirpus robustus* L.  
 5. *Scirpus hololepis* (L.) Link.  
 6. *Scirpus cespitosus* (L.) Link.  
 7. *Scirpus atrovirens* (L.) Link.  
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Leslie G. Polgar  
Ronald S. Cok

Thomas H. Close

Commissioner for Patents  
Attn: Box Patent Application  
Washington, DC 20231

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## **AN ELECTRONIC COMMUNICATION, AND USER INTERFACE KIT**

### **FIELD OF THE INVENTION**

The present invention relates to portable electronic devices and  
5 more particularly to electronic devices having user interface displays.

### **BACKGROUND OF THE INVENTION**

Portable electronic devices are used for many applications.  
Examples include telephones, personal digital assistants (PDAs), pagers, global  
10 position systems, digital cameras, and the like. These devices typically include  
separate batteries, re-chargers, displays, and touch screens where necessary. For  
users with multiple devices, the need to carry more than one device means that  
redundant battery, display, and user interfaces are carried as well. These  
redundant components of electronic devices are costly, bulky, heavy, and a  
15 nuisance to carry and organize.

Portable organizational containers, such as notebooks or 3-ring  
binders with attractive covers are commonly used. Such containers incorporate  
papers, pads, writing instruments, calculators and the like but are not well adapted  
to carry electronic devices. Larger containers such as briefcases are designed for  
20 carrying a wide variety of electronic devices but do not provide a means to reduce  
the redundancy of components. It is also known to provide items of clothing  
designed to carry electronic devices. Some of these items include network  
connectors. Such collections of devices still do not address the problem of  
redundant components and power supplies.

25 There is a need therefore for an improved container incorporating a  
variety of mobile electronic devices that is convenient and does not require  
redundant components.

### **SUMMARY OF THE INVENTION**

30 The need is met according to the present invention by providing an  
electronic communications and user interface kit that includes a display device; a

plurality of separate electronic devices capable of directly utilizing the display device; and a portable container with an interconnection system integrated into the container and connected to the display device and the plurality of electronic devices for transferring display information from the plurality of electronic devices to the display device. The expression directly utilizing as used herein means that the electronic devices communicate directly with the display device without the need for a separate central processor.

### ADVANTAGES

The present invention has the advantage that it can provide a single high quality display for a plurality of electronic devices thereby reducing the cost of providing a separate display for each device.

### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic diagram illustrating an electronic communications and user interface kit according to the present invention;

Fig. 2 is a schematic diagram of a display device having a touch screen that is useful in the kit of the present invention;

Fig. 3 is a plan view of an electronic communications and user interface kit according to the present invention; and

Fig. 4 is a plan view of an electronics communications and user interface kit according to the present invention, contained in an article of clothing.

### DETAILED DESCRIPTION OF THE INVENTION

Portable electronic devices are used for many applications. Examples include telephones, personal digital assistants (PDAs), pagers, global position systems, digital cameras, and the like. These devices typically include separate batteries, re-chargers, displays, and touch screens where necessary. For users with multiple devices, the need to carry more than one device means that redundant battery, display, and user interfaces are carried as well. These

redundant components of electronic devices are costly, bulky, heavy, and a nuisance to carry and organize.

The present invention addresses these problems by providing a kit including a portable container incorporating a system interconnecting a variety of electronic devices to a single display device. The electronic devices can include a battery and the connection system can include a power distribution network, thus providing a common power source for all of the electronic devices. The separate display device can include an optional touch screen. The display device acts as a common visual interface to all of the electronic devices. Each electronic device utilizes the display device for the visual user interface requirements of that device and communicates to the display device through the interconnection network. Various software tools are available to support the use of a shared display and user input devices, as is well known in the art.

Fig. 1 is a schematic diagram of an electronic communications and user interface kit according to the present invention. Referring to Fig. 1, the kit incorporates a display device **12**, an interconnection network **14**, and separate electronic devices **16** physically placed within a container **11**. The interconnection network **14** includes a power distribution network **18** and a communications network **19** supplying power and communication connections to each electronic device **16** and the display device **12**. The communications network **19** may be a wired connection, or may provide a wireless connection to one or more of the electronic devices **16** and the display device **12**. The electronic devices **16** and the display device **12** are each provided with a network and power interface connection **44**. The power distribution network **18** is connected to a power supply **17** sufficient to supply the power needs of the electronic devices **16** and display device **12**. The power supply can be a battery (preferably rechargeable) or a fuel cell. An external connector **13** can be provided for connecting to a charger **15** for recharging the power supply **17**. Alternatively, the charger **15** can be included in the container **11** as part of the kit. The communications network **19** can be any standard communication connection such as Ethernet or Universal Serial Bus (USB) using any compatible existing standard

communication protocols, such as TCP/IP, etc. as is well known and widely available.

Referring to Fig. 2, the display device **12** includes a display screen **20** and may optionally include a touch screen **22** mounted with the display screen **20**. Preferably, the display screen is between 5 x 8 cm and 12 x 20 cm and has a resolution of between 40 and 100 display elements. The display device **12** also includes a network interface and controller **24** to operate the display screen **20** and touch screen **22** and to communicate with the electronic devices **16**. The display screen **20** can be a liquid crystal display or, preferably, an organic light emitting diode display. The interface and controller **24** for the display screen **20** is conventional and known in the art. The touch screen **22** can employ 4- or 5-wire resistive touch screen technology or other touch-sensitive technology as is also known in the art.

The display device **12** may be physically connected to the connection network with wires or, alternatively, incorporate a transceiver **26** and antenna **28** to communicate with a transceiver **46** (shown in Fig. 3) located in the container **11** and connected to the communications network **19**. Any suitable wireless communication technique may be used (e.g. RF or infrared). RF standards such as the Bluetooth standard or an 802.11a or b, or 802.15 compliant mechanism are preferred.

If a wireless connection is implemented, the display device **12** includes a power supply of its own **30**. The power supply **30** can be a battery (preferably rechargeable), a capacitor, or a fuel cell. This power supply **30** may be relatively small compared to the power supply **17**, and can be recharged from the larger power supply **17** in the container **11** (when connected to the connection system) and may only need to operate for a few minutes or as is necessary to interact with an electronic device **16**. The display device **12** is provided with a connector **44** that can be readily disconnected from the power distribution and communications network **14**. Preferably, the controller **24** automatically switches the display device **12** from a connected mode (obtaining power and recharging power supply **30** through the power distribution network **18** and

communicating through the communications network 19) to a disconnected mode using the local power supply 30 and the transceiver 26 for communication with the electronic devices 16.

5 The electronic devices 16 are independent and can be individually removed from the network 14 without affecting the other electronic devices. The electronic devices utilize a software layer providing discovery and communication services such as UPNP (universal plug and play) as is also known in the art and commercially available.

10 The user display device 12 may also incorporate other interaction modalities, such as microphones 32 or speakers 34, as necessary to support the available electronic devices 16 and may be integrated or external (for example, a headset). Alternatively, as shown in Fig. 3, the microphone 32 and speaker 34 may be included as an independently powered headset with a wireless connection to a transceiver/network interface 46 connected to communications and power  
15 network 14. Alternatively, the headset can be connected directly to the communications and power network 14 through a network interface (not shown).

In operation, the devices communicate through the network 19 and to the user interface device 12. Their power is obtained through the power distribution network 18, thus enabling very small, lightweight, and inexpensive  
20 devices to use a common power supply and user interface. Any of a wide variety of electronic devices may be incorporated into the kit, including a cell phone 52, a pager 54, a PDA 56, a portable video or audio player 58, a digital camera (not shown), a television receiver, or a GPS device (not shown), and the like. A compact keyboard 60 provided with a network interface 44 connected to the  
25 network 14 can be provided. The compact keyboard 60 can be a folding keyboard such as the Stowaway™ folding keyboard sold by ThinkOutside Inc. The keyboard may also be provided with a separate power supply and wireless connection as described above with respect to the display device 12.

30 The electronic devices 16 may include wireless connections to external devices and communication networks such as cellular communication

networks, global positioning satellites and local computer network access points, thus providing access to the Internet or to other computer systems.

Referring to Fig. 3, the container 11 can be implemented as a notebook with covers 40 as is commonly done with notebooks incorporating pads of paper, writing instruments, flat calculators, and the like. Preferably, the notebook has edge enclosures that can be zippered shut for security of the electronic devices inside. On each cover 40 are device storage locations 42 such as pockets, bands or similar device restraints where the electronic devices 16 can be secured. The container may also be used to carry conventional notebook materials such as pens and papers. At each device storage location, a connection 44 to the power distribution and communications network is provided. The interconnection system 14 can be integrated into the covers and spine of the notebook as can any antennae 64 utilized by the electronic devices and display device. A wide variety of arrangements can be created to implement the storage and connection mechanisms for the devices.

Referring to Fig. 4, the container may also be implemented as an article of clothing, such as a vest 66, with pockets 68 in the vest for receiving the electronic devices and the display, and the interconnection system being integrated into the vest. A headset 48 can be connected to the communications interconnection 14 as shown.

The invention has been described in detail with particular reference to certain preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

## PARTS LIST

10	kit
11	container
12	display device
13	external connector
14	interconnection network
15	charger
16	electronic device
17	power supply
18	power distribution network
19	communications network
20	display screen
22	touch screen
24	controller
26	transceiver
28	antenna
30	power supply
32	microphone
34	speaker
40	covers
42	device storage locations
44	interface connection
46	transceiver/network interface
48	headset
52	cell phone
54	pager
56	PDA
58	audio/video player
60	compact keyboard
64	antenna
66	vest
68	pocket